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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

EDWARDS, PATRICK L

ART UNIT PAPER NUMBER

2621

DATE MAILED: 06/27/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/675,279

Applicant(s)

JIANG, HONG

Examiner

Patrick L. Edwards

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 February 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7, 9, 10, 12, 13, 16, 19, 20, 32 and 34 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7, 9, 10, 12, 13, 16, 19, 20, 32 and 34 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

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DETAILED ACTION

1. The response received on 14 February 2005 has been placed in the file and was considered by the examiner. An action on the merits follows.

Response to Arguments

2. The arguments filed on 14 February 2005 have been fully considered. A response to these arguments is provided below.

Drawing Objections

Summary of Argument:

Applicant has amended the drawings to overcome the two drawing objections made in the previous office action.

Examiner's Response:

The drawing objections are hereby withdrawn.

Prior Art Rejections

Summary of Argument:

1. With respect to exemplary independent claim 1, applicant argues that Hazra does not teach all of the required limitations. Specifically, applicant argues that Hazra fails to meet the requirement that a single bandwidth be specified for each of multiple layers and that each of the layers consume substantially the specified bandwidth (remarks pg. 10).

2. Further referring to exemplary independent claim 1, applicant argues that Hazra does not teach the newly added limitation of determining an amount of available bandwidth (remarks pg. 10).

3. With respect to exemplary claim 7, applicant argues that Li does not teach enhancement layers with equal bandwidth as is required by the claim (see remarks pg. 11).

4. With respect to claims 2 and 5, applicant repeats the hazra single bandwidth argument from # 1, and further argues that neither Hazra nor Li suggest a threshold value based on the amount of available bandwidth (remarks pg. 11).

5. With respect to claims 3 and 6, applicant argues that Hazra and Li do not suggest the transmission of a threshold value over a digital communication channel (remarks pg. 12).

Examiner's Response:

1. The examiner disagrees. The claim simply requires that a single bandwidth is specified for each of multiple layers of digital video. Hazra specifies a single bandwidth (10 Kbps) for each of multiple layers (enhancement layers 2 and 3) of digital video based on the amount of available bandwidth (see col. 6 lines 64-65). Applicant's arguments that Hazra discloses other layers with different bandwidths is irrelevant. Two layers qualifies as the

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claimed “multiple layers,” (the word ‘multiple’ simply means more than one – see Webster’s dictionary) and a single bandwidth is indeed specified for these multiple layers. Thus, Hazra teaches all of the limitations required by the claim.

2. Applicant’s argument is directed to a limitation not previously presented in the claims. Accordingly, it will be addressed in the below rejection.

3. The examiner disagrees. Applicant’s argument comes up short on two different levels. First of all, applicant alleges that Li fails to disclose enhancement layers having equal bandwidth. The language of the claim, however, does not require that the enhancement layers have equal bandwidth. It simply requires that the claims consume substantially the same bandwidth. Applicant’s arguments are therefore irrelevant because they are not directed to a claimed limitation.

Secondly, it appears that the applicant has mischaracterized the teachings of the Li reference. Even if we assume, *arguendo*, that the claim calls for enhancement layers with equal bandwidth, the Li reference would still anticipate this limitation. Admittedly, Li never explicitly states that the enhancement layers have the same bandwidth as each other, but the following analysis illustrates why this is the case.

Li discloses processing layers of digital video enhancement data to enhance a base video signal (Li col. 3 lines 44-58). The bandwidth of these layers is based on an amount of overall available bandwidth (Li col. 5 lines 57-58).

Li elaborates on the enhancement layers at col. 4 lines 15-21, “A video encoding method for encoding enhancement layers based on a base layer bitstream encoded from a video input, the video encoding method includes, taking a difference between an original DCT coefficient and a reference point and dividing the difference between the original DCT coefficient and the reference point into N bit-planes.” The N bit-planes are analogous to N enhancement layers (see further col. 7 lines 17). Thus, this passage shows that the enhancement layers are formed by dividing the difference between the DCT coefficient and the reference point by an integer N. This will produce enhancement layers which consume substantially the same bandwidth.

Further, Li discloses that the server and the transmission channel are synced up (i.e. the server knows the bandwidth associated with the transmitter) (Li col. 6 lines 1-4 with Figure 1a). Thus, the bandwidth (the data transfer rate) is fixed by the transmission channel and all the bitstreams that are sent from the server to the transmission channel consume the same bandwidth.

Li also discloses that there is a fixed number of bits for coding a frame (Li col. 8 lines 42-43) and that the method can operate in a fixed bitrate environment (Li col. 8 line 61). Bandwidth is simply the number of bits that can be transferred for a period of time. Since we have a fixed number of bits and a fixed bitrate, it follows that the enhancement layers will consume substantially similar bandwidth.

Finally, the Li disclosure details a layered scalable video coding method. This type of method has a base layer bit rate and an enhanced layer bit rate. Since the bit rate for all the enhanced layers is the same, those layers will consume substantially the same bandwidth.

4. The examiner disagrees. Li discloses selecting the priority of the layers on the basis of the available bandwidth. Since the layers are generated based on the bandwidth and the bandwidth determines the priority

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identifier, then the layers are generated based on their priority (i.e. threshold value). The assigned priority identifier acts as a threshold based upon the bandwidth requirements because only those layers with priority identifiers that satisfy the bandwidth requirement are transmitted.

5. The examiner disagrees. The enhancement data is transmitted over channel 60 and the reference further describes that the number of bit stream layers reaching the destination point 100 can be further limited by the priority identifier. Accordingly, this value is transmitted.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1, 4, 19, 32, and 34 are rejected under 35 U.S.C. 102(e) as being anticipated by Hazra (USPN 6,510,553 B1).

With regard to claim 1, Hazra discloses specifying bandwidths for multiple layers of digital video as specified bandwidths (see column 6 lines 37-51). Hazra further discloses forming multiple layers of digital video enhancement data, where each of said multiple layers has a single, specified bandwidth, and that the single specified bandwidths are the same (see col. 6 lines 45-49, which describes multiple layers of video enhancement data (ie enhancements layers 2 and 3) that have the same specified bandwidth (in this case, that specified bandwidth is 10 K BPS)). Hazra further discloses determining an amount of available bandwidth (Hazra col. 9 lines 9-10).

In summation, enhancement layers 2 and 3 from Hazra qualify as the “multiple layers of digital video enhancement data” recited in the claim. These two layers are both associated with single specified bandwidths, and these bandwidths are the same (ie they are both 10 K BPS). Therefore, all of the limitations of the claim are met by the Hazra reference.

With regard to claim 32, Hazra discloses that the forming comprises forming multiple layers which have digital ones and digital zeros, and wherein each of said multiple layers include substantially the same number of digital ones (see column 6, lines 45-51: The reference describes that the enhancement layers are digital signals and that the second and third enhancement layers have the same specified bandwidth. Therefore, the second and third enhancement layers will have substantially the same number of digital ones.).

With regard to claim 19, Hazra discloses a method comprising: generating from a source video sequence a digital base video signal (see column 6, lines 37-42: The reference describes that the video stream comprises a plurality of layers including a base layer.); generating from the source video sequence a body of digital video

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enhancement data (see column 6, lines 42-51: The reference describes plural layers of digital video enhancement data (the enhancement layers 2 and 3 disclosed in Hazra qualify as plural layers)). The reference further describes that these enhancement layers have a specified bandwidth, and that this bandwidth is the same for both layers (see column 6 lines 45-49: This excerpt from the reference describes plural layers of enhancement data which both have specified bandwidths of 10 K BPS).

With regard to claims 4 and 34, which merely call for an article comprising a computer-readable medium which stores computer-executable instructions for performing the processing of claims 1 and 32, Hazra discloses such an article since all of the processing performed by the system of Hazra is performed on a computer (see Fig. 2: Reference numeral 38 referring to a client system.).

5. Claims 7, 9, 10, and 12 are rejected under 35 U.S.C. 102(e) as being anticipated by Li (U.S. Patent No. 6,275,531 B1).

As applied to claim 7, Li discloses a method comprising: processing layers of digital video enhancement data to enhance a base video signal, the layers having substantially equal amounts of bandwidth (see column 3, lines 11-16, lines 44-52, and column 5, lines 62-67: The reference describes that each enhancement layer is capable of carrying information complementary to the base layer information thereby enhancing the base layer. The reference also describes that the enhancement layers are determined based on the bandwidth of the transmission channel. The reference further describes that the number of enhancement layers are limited by the bandwidth requirements. These layers will, therefore, have approximately equal bandwidth requirements.).

As applied to claim 9, Li discloses that the base video signal comprises a picture, and wherein each processed layer enhances the entire picture (see column 3, lines 11-16: The reference describes that adding the corresponding enhancement layers to the base layer improves the resulting images (i.e. enhances the entire picture)).

As applied to claims 10 and 12, which merely call for an article comprising a computer-readable medium which stores computer-executable instructions for performing the processing of claims 7 and 9, Li discloses such an article since all of the processing performed by the system of Li is performed on a computer (see Fig. 1: This figure shows the system used by Li.).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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7. Claims 2, 3, 5, and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Hazra (USPN 6,510,553) and Li (USPN 6,275,531). The arguments as to the relevance of Hazra in the rejection of claim 1 and Li in the rejection of claim 7 above are incorporated herein.

Claim 2 calls for the forming of a layer of video enhancement data to further comprise: selecting a threshold value based upon the bandwidth requirements; and generating a layer of video enhancement data based upon the threshold value. Claim 3 further calls for transmitting the layer of video enhancement data over a digital communication channel; and transmitting the threshold value over the digital communication channel. Hazra does not disclose the use of a threshold value to generate the enhancement data or transmitting the threshold value over a digital communication channel. However, Li, in the same field of endeavor of video coding and the same problem solving area of scalable video coding, discloses the features of claims 2 and 3 (see Fig. 1 and column 5, lines 47-67: Regarding claim 2, the reference describes that the number of bit-stream layers generated is a function of the total possible bandwidth. Therefore, since the layers are generated based on the bandwidth and the bandwidth determines the priority identifier, then the layers are generated based on their priority (i.e. threshold value). The reference further describes that each layer is assigned a priority identifier. This priority identifier acts as a threshold based upon the bandwidth requirements because only those layers with priority identifiers that satisfy the bandwidth requirement are transmitted. Regarding claim 3, as can be seen in Fig. 1, the enhancement data is transmitted over channel 60 and the reference further describes that the number of bit-stream layers reaching the destination point 100 can be further limited by the priority identifier (i.e. threshold). Therefore, this value must also be transmitted.).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify Hazra by adding the use of a threshold and transmitting the threshold as taught in Li because the method used in Li overcomes the disadvantages of the current MPEG-2 video coding standard as described at column 2, lines 51-67 of Li. Therefore, the use of the method disclosed by Li will increase efficiency and allow for scalable granularity.

As applied to claims 5 and 6, which merely call for an article comprising a computer-readable medium which stores computer-executable instructions for performing the processing of claims 2 and 3, the combination of Hazra and Li discloses such an article since all of the processing performed by the system of Hazra and Li is performed on a computer (see Fig. 1: This figure shows the system used by Li.).

8. Claims 13, 14, 16, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Li (U.S. Patent No. 6,275,531 B1) and Li et al. (the article titled "An Embedded DCT Approach to Progressive Image Compression").

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As applied to claim 13, Li discloses a method comprising: receiving a layer of digital video enhancement data that achieves a bandwidth requirement (see Fig. 1 and column 3, lines 44-52: The reference describes determining a number of enhancement layer bit-streams based on the available bandwidth. These enhancement layers are received by demultiplexor 70.), and transmitting the layer over a digital communication channel (see Fig. 1: As can be seen from the figure, the enhancement data is transmitted over channel 60.).

As applied to claim 36, Li discloses that the layers are digital values having substantially the same number of digital ones (see column 11, lines 59-62: The reference describes that the bit-planes (i.e. layers) are digital values and that the MSB-plane and the second MSB-plane have the same number of digital ones.).

Claim 13 further calls for receiving a threshold value corresponding to the layer, wherein the layer comprises a '1' bit for each magnitude greater than or equal to the threshold value.

While Li discloses the use of bit planes to determine the enhancement layers, the reference does not disclose the type of processing described by claims 13 and 14. Li et al., in the same field of endeavor of video processing, does disclose such processing (see Section 3, Pages 202-203: The reference discloses that several layers are formed based on different threshold levels required by the bandwidth. The reference further describes that each layer is formed based on a significant threshold and that each coefficient is assigned a magnitude of '1' if it is greater than the threshold and a magnitude of '0' if it is less than the threshold.).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify Li by adding the processing steps of Li et al. because this type of processing is "more efficient" and is "easier and can be done more accurately" (see Li et al.: Section 3, Page 204).

With regard to claim 16, which merely calls for an article comprising a computer-readable medium which stores computer-executable instructions for performing the processing of claims 13, 14, and 36, the combination of Li and Li et al. discloses such an article since all of the processing performed by the system of Li and Li et al. is performed on a computer (see Fig. 1: This figure shows the system used by Li.).

9. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Hazra (U.S. Patent No. 6,510,553 B1) and Li et al. (the article titled "An Embedded DCT Approach to Progressive Image Compression"). The arguments as to the relevance of Hazra in the rejection of claim 19 above are incorporated herein.

Claim 20 calls for the step of generating a layer of digital enhancement data to further comprise: selecting a threshold value; and forming a layer of digital enhancement data comprising a '1' bit for each magnitude greater than or equal to the threshold value. This element is absent from Hazra, but is clearly disclosed in Li et al. (see Section 3, Pages 202-203: The reference discloses that several layers are formed based on different threshold levels required by the bandwidth. The reference further describes that each layer is formed based on a significant threshold and that each coefficient is assigned a magnitude of '1' if it is greater than the threshold and a magnitude of '0' if it is less than the threshold.).

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It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify Hazra by adding the processing steps of Li et al. because this type of processing is "more efficient" and is "easier and can be done more accurately" (see Li et al.: Section 3, Page 204).

Conclusion

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.
- Wu et al. (USPN 6,700,933) teaches advance predicted bit-plane coding of multiple enhancement layers.
 - Tillman et al. (USPN 6,496,980) discloses multiple enhancement layers consuming the same bandwidth.
 - Hsieh et al. (USPN 5,995,150) teaches bandwidth allocation methods in a video compression environment.
 - Puri (EP 644695A2) teaches a spatio-temporal weighting process to produce the best bandwidth efficiency in a scalable layered coding scheme.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Patrick L Edwards whose telephone number is (571) 272-7390. The examiner can normally be reached on 8:30am - 5:00pm M-F.

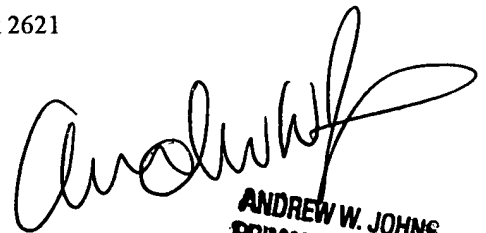
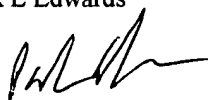
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joe Mancuso can be reached on (571) 272-7695. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Patrick L Edwards

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ANDREW W. JOHNS
PRIMARY EXAMINER